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TIA

Tasmanian Institute of Agriculture

Tasmanian Government

TIA is a joint venture of the University of Tasmania and the Tasmanian Government

On-farm adoption of low emissions feed technologies for improved profitability of the Tasmanian livestock sector

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Project overview

Project: On-farm adoption of low emissions feed technologies for improved profitability of the Tasmanian livestock sector

Funding source: Tasmanian Government, Agricultural Innovation Fund

Lead organisation: Tasmanian Institute of Agriculture (TIA)

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Project duration: July 2022 – June 2026

KEY POINTS

- Enteric methane emissions from livestock make up 72% of total emissions from agriculture in Australia.
- Emerging methane inhibiting feed additives offer a potential solution, but associated challenges must be addressed.
- Industry adoption of low-emissions feed additives will rely on improvements in animal productivity.

The challenge

The agricultural sector is facing increasing consumer and community pressure to reduce greenhouse gas emissions.

Enteric methane emissions from livestock account for a significant proportion of Australia's overall agricultural emissions, totalling approximately 72% in 2022-23[1].

One potential opportunity to help producers directly reduce emissions is through emerging methane reducing feed additives.

Through science, the Tasmanian Institute of Agriculture (TIA) is helping to address the challenges associated with the practical delivery of feed additives in Tasmania's grazing-based systems.

This project evaluated methane-reducing feed additives across beef, sheep, and dairy production systems to understand how they could be practically and effectively used in Tasmania's grazing-based systems.

A key focus was the delivery of methane inhibitors such as bromoform, the key bioactive compound in Asparagopsis, and assessing practical methods to achieve consistent intake while maintaining animal performance.

This was an important focus as the potential for reduced dry matter intake has been shown through research to be a significant risk associated with high levels of methane inhibition.

Image caption: *Assessing liveweight and methane on-farm at Freer Farm, Burnie.*

www.agriculture.gov.au/agriculture-land/farm-food-drought/climatechange/carbon-farming-outreach-program/training-package/topic-1/5-reducing-emissions

Our response

Key activities included:

- Beef trials evaluating biochar-based loose licks as delivery systems for emerging Asparagopsis formulations, including products that used canola oil to stabilise bromoform. Beef trials also assessed the use of the emerging Agscent x Optiweigh technology for methane and liveweight monitoring.
- Sheep trials investigating inclusion rates, adaptation strategies and co-supplementation approaches in controlled feeding studies, alongside evaluation of lick blocks under commercial farming conditions.
- Dairy trials assessing rumen modifiers as an alternative methane mitigation strategy with the potential to deliver productivity benefits alongside emissions reduction.
- Cost-benefit modelling complemented these trials to identify break even points for profitability with this work now integrated into Dairy Australia's carbon calculator.

What we learnt

Asparagopsis and its key bioactive compound bromoform is highly effective at reducing enteric methane emissions from livestock. However, several challenges were identified that may potentially limit widespread adoption in grazing livestock systems.

The main challenge is achieving a consistent and target dose rate that optimises methane mitigation without compromising animal performance. High inclusion rates of bromoform have been linked to reduced dry matter intake, which may negatively affect animal productivity and therefore requires careful management.

Key findings included:

- Consistent and controlled daily intake of methane inhibitors remains an ongoing challenge under grazing conditions.
- Lick block formulations showed potential for extensive livestock systems, as they appear to provide relatively controlled intake and reduced risk of overconsumption.
- Gradual transition periods of up to 30 days reduced, but did not fully eliminate, the risk of reduced dry matter intake in sheep offered a methane inhibitor.
- Co-supplementing the key bioactives in Asparagopsis with other feed additives was explored as a strategy to reduce dry matter intake risks, but the additives tested (biochar, *Ascophyllum*, and grape marc) were ineffective, indicating alternative solutions are needed.
- While rumen modifiers offer lower methane mitigation potential, their adoption is more likely due to a potential animal productivity co-benefit and current price point.

Overall, the project improved the understanding of the practical, biological and economic factors that will influence the adoption of methane mitigation technologies in pasture-based livestock systems

Image caption: *(top) Sheep trial. (bottom) Green Feed unit at the TIA Dairy Research Facility.*

What's next

Overall, this project has strengthened TIA's capability to evaluate both animal performance and methane mitigation strategies for Tasmania's pasture-based systems.

An opportunity for future research is on assessing the methane reduction potential of the pasture base itself, with a focus on exploring low emissions forage options.

For more information, please contact Rohan Borojevic rohan.borojevic@utas.edu.au

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